C:\Users\Kiera Jay\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\O1XRGHFG\MC900286528[1].wmf**Spring 2013 Syllabus**

**Teacher:** Mrs. Timme  
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**Summary of Unit**

Architects, Biomedical Engineers, Astronomers, Veterinary Technicians, Statisticians, Computer Programmer, these are just a few of the many exciting occupations that use scientific notation! In this unit we will uncover the meaning behind this new language. Beginning with a study of the key component to understand scientific notation – exponents, and ending with an exploratory look at its real word applications. Google Earth, collaborative challenges, and iMovie will be just some of the cool tools we will utilize in order to guide us on our mathematical journey.

**Establish Goals**

**Common Core State Standards**  
**Content Area:** Mathematics  
**Grade Level:** Grade 8  
**Domain:** Expressions and Equations  
**Cluster:** Work with radicals and integer exponents.  
**Standard:** 1, 3, 4  
1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, 3^2 x 3^-5 = 3^-3 = 1/3^3 = 1/27*  
3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is smaller than the other. *For example, estimate the population of the United States as 3 x 10^8 and the population of the world as 7 x 10^9, and determine that the world population is more than 20 times larger.*  
4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g.,use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

**Students will understand that…**

• exponents can be used to express numerical values in different, but equivalent, ways  
• scientific notation is used/can be used to represent large and small quantities.  
• scientific notation has real-world applications

**Essential Questions:**

• How can we use exponents to express numerical values in different, but equivalent, ways?  
• How and why is scientific notation used to represent very large or very small values?  
• How is scientific notation applied in the real world?

**Students will know:**

• Definitions: Exponents, scientific notation, powers, standard notation,  
decimals, integers  
• Critical Details: Properties of exponents, place value, negative, exponents,  
scientific notation operations, magnitude, measurements and units.  
• Applications: Real world use of scientific notation, problem solving strategies, data analysis, finding rates.

**Students will be able to…**

• demonstrate how to convert numbers expressed as decimals to scientific notation and vice-versa.  
• represent large and small quantities using scientific notation.  
• solve problems involving scientific notation.  
• analyze data that contains scientific notation.  
• relate real numbers to their exponential form  
• recognize when, and how, to use the properties of exponents.

**Performance Task Overview**

The Endangered Species division of U.S Fish and Wildlife Services is looking to commission a team of Environmental Researchers to create multimedia fact-sheets that raises public awareness about endangered species in their states.In order to decide which team of researchers they are going to use, the U.S Fish and Wildlife Services wants to see an example of a multimedia fact-sheet for a particular states' endangered species.The fact-sheet must include at least five state endangered species (one bird, one mammal, one plant life, one insect, one fish). In addition, the fact-sheet must provide the following data: 1. Size of the animal/plant, 2. Habitat location and range (size), 3. Image of the Animal, 4. Population size, 5. Rate of population decline/growth over the last 5 or 10 years, 6. Size relative to average human (e.g, 20 times smaller), 6. An interesting/fun fact, 7. Distance of Migration (if applicable). All measurements must have appropriate units and be given in both standard and scientific notation. Federal and State Endangered Species division officials will decide the winning team. Winners will not only be awarded this valuable commission, they will also been flown out to Washington DC for the National Wildlife Federations annual gala where they will present the final product.

**Expectations**

**Absences:** Being present and accounted for is crucial for your success in this class. Students are expected to attend and actively participate in every class. Should you have to miss class for any reason, you are expected to download any handouts, assignments, and SmartBoard presentations from the class wiki. If you know in advance that you are going to miss class(es) please let me know, via phone or email, as soon as possible so we can set up a plan to keep you on track with the lessons you are missing. Although the class wiki is a helpful tool to help you keep up with missed lessons, it is no substitute for the important learning that occurs during group discussion and interactions with your fellow classmates. If possible, try to establish a homework buddy who can help you catch up with the stuff you have missed. It is recommended you find a homework buddy early in the semester.  
  
**Plagiarism:** As students you expect to get credit for all the hard work you do, the real world is no exception. Any time you use words, information, resources, or materials that are not your own creation in your student work, you must cite your sources to ensure the original creator gets the credit they deserve. Plagiarism (using work that is not your own) is a form of academic dishonesty and will not be tolerated in this class. Any instances where a student is suspected of plagiarism will be handled in a manner consistent with the school policy.  
  
**Assignments:** Assignments are a way for you to show me what you know. As such, it is important that they are submitted to me by the given due date. If you feel you need more time, or additional support, in order to complete assignment, please let me know in advance of the due date so we can agree upon a new deadline for you to reasonably complete the work. Please note: Assignments are not a final judgement of you. They are a tool I use to help me get a better idea of your needs, so I can adjust my instructional approach to better aid your learning.  
  
**Classroom Expectations**: All students benefit from being in a harmonious and productive environment. As such, students are expected to adhere to the following three principles: *Be Respectful*, *Be Responsible*, and *Be Safe*.

**Benchmarks (500 explicit points)**

• **Glogster** *(75 points)*: Create a digital poster showing your fellow 8th graders how to convert numbers from standard notation to scientific notations and vice versa. Your poster can include any images, videos, music/sounds to help your poster grab attention and get students interested in scientific notation.  
  
• **Blog** *(75 points)*: Use the links from the class wiki to find data about very large and very small objects, animals, buildings, etc…Then write a blog posting which includes an image and the measurements of your chosen data in scientific and standard notation. You must cite your sources.  
  
• **Show Me App** *(75 points)*: Design an 8 question scientific notation operations quiz for you fellow classmates. Then, using the "Show Me" app, create a step by step answer key for each question. As the app allows you record while you write, your answer key must include a verbal component. This could be you explaining each step as you go, or you do your explanation through a song or a rap.  
  
• **Google Earth & Prezi** *(75 points)*: Use Google Earth to find population statistics and other information about two different countries. Use this information to create a Prezi presentation that compares and contrasts the two countries data. This comparison must include an analysis of the two countries. For example: how many times bigger the population (or other figure) of one country is than the other? Be sure you cite your sources.  
  
• **Wix.com** *(75 points)*: Create a website using wix.com that demonstrates how real numbers can be expressed using exponents. The website you create should act as a study guide for anyone who wanted to learn about exponents. It should also include at least one of the following: images, videos, and audio. Ensure you site your sources.  
  
• **iMovie** *(75 points)*: Create a news report as if the "Properties of Exponents" have just been discovered and you have to explain them to the world. Get creative! Think about who your audience is. Are they nature enthusiasts, scientists, sports fans, etc...?  
  
• **Performance Task** (*200 points*): The Endangered Species division of U.S Fish and Wildlife Services is looking to commission a team of Environmental Researchers to create multimedia fact-sheets that raises public awareness about endangered species in their states.In order to decide which team of researchers they are going to use, the U.S Fish and Wildlife Services wants to see an example of a multimedia fact-sheet for a particular states' endangered species.The fact-sheet must include at least five state endangered species (one bird, one mammal, one plant life, one insect, one fish). In addition, the fact-sheet must provide the following data: 1. Size of the animal/plant, 2. Habitat location and range (size), 3. Image of the Animal, 4. Population size, 5. Rate of population decline/growth over the last 5 or 10 years, 6. Size relative to average human (e.g, 20 times smaller), 6. An interesting/fun fact, 7. Distance of Migration (if applicable). All measurements must have appropriate units and be given in both standard and scientific notation. Federal and State Endangered Species division officials will decide the winning team. Winners will not only be awarded this valuable commission, they will also been flown out to Washington DC for the National Wildlife Federations annual gala where they will present the final product.  
  
• **Homework/Assignments** *(25 points)*  
  
• **Reflective Journal** *(25 points)* : Students will be expected to complete a reflective journal about their experiences with the content and to reflect about their progress as a learner. Students will be provided with 5-10 minutes at the end of each class to write in their journals.

**Grading Scale**

**A** (93 -100), **A-** (90 - 92), **B+** (87 - 89), **B** (83 - 86), **B-** (80 - 82), **C+**(77 - 79), **C** (73-76), **C-** (70 - 72), **D+**(67 - 69), **D** (63 - 66), **D-** (60 - 62), **F** (0 - 59).